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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/599,027	06/22/2000	Nagayoshi Ichikawa	016887/0999	8692

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FOLEY AND LARDNER  
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EXAMINER

PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 08/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/599,027

Applicant(s)

ICHIKAWA ET AL.

Examiner

Rick Palabrica

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12 and 14-27 is/are pending in the application.
- 4a) Of the above claim(s) 1-9, 16, 19-22, 26 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10, 12, 14, 15, 17, 18 and 23-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicant's amendment in Paper No. 23, which revises claim 10 and adds new claim 27, is acknowledged. This amendment is in response to a 2/3/03 Office Action.

2. New claim 27 is directed to an invention that is independent or distinct from the invention originally claimed. This claim recites a Ti metal particle as forming a photocatalytic substance. In Paper No. 7, applicant elected  $\text{TiO}_2$  as the photocatalytic substance. Clearly, this new claim pertains to an invention that is new, distinct and restrictable from the originally claimed invention.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 27 is withdrawn from consideration as being directed to a nonelected invention. See 37 CFR 1.142(b) and MPEP 821.03.

2. Applicant traversed the use of the Hettiarachchi references in the rejection of claims, as per said Office Action. Applicant alleges that Hettiarachchi's mixture of platinum group and non-platinum group compounds, "do not denote providing Pt on the surface of each particle, as mixtures are known to one of ordinary skill in the chemical arts to be mere concoctions of various elements and compounds having no chemical bonds between them (and if any are present, they exist in trace amounts)". The examiner disagrees for the reasons given below.

First, it is noted the feature upon which applicant relies (i.e., chemical bonding between elements) is not recited in rejected claims. The claim recites that at least one of Pt, Rh, Ru and Pd is provided on a surface of a photocatalytic substance. The term "provided" is a broad term that is not limited to having one element or substance "chemically bond" with another element or substance. The term can mean that an element is "supplied" on the surface of another element. Certainly, when platinum is present in excess of titanium, as in Hettiarachchi's platinum-titanium mixture, platinum is supplied and will inherently adhere or coat the surface of titanium particles.

Second, applicant himself admits that chemical bonding may occur between platinum and titanium in Hettiarachchi's mixture, albeit in trace amounts. Again, there is no limitation in the claims that precludes such trace amounts being unacceptable.

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

3. Applicant has amended the claims to recite that  $\text{TiO}_2$  is formed prior to introduction into the reactor feedwater and he alleges that the neither one of the Hettiarachchi references discloses, teaches or suggests this feature. Upon further detailed review of said references, the examiner noted that both references disclose the platinum compound as being in an aqueous solution or suspension (see column 5, lines 48+ in Hettiarachchi '893 and Column 5, lines 50+ in Hettiarachchi '991). Therefore, in Hettiarachchi's mixture of platinum and titanium, there will inherently be  $\text{TiO}_2$  formed.

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These  $\text{TiO}_2$  are available prior to introduction of the mixture into the feedwater of the reactor, as per the claim limitation.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 10, 14, 15, 17, 18, and 25 are rejected under 35 U.S.C. 102(b) as being unpatentable over either one of Hettiarachchi (U.S. 5,818,893) or Hettiarachchi (U.S. 5,904,991).

Either one of Hettiarachchi ('893) or Hettiarachchi ('991) discloses a method for protecting against stress corrosion cracking in a water-cooled reactor by injection into the reactor water of a noble metal, such as platinum or palladium, in conjunction with titanium and hydrogen, to reduce the electrochemical corrosion potential at the surface of reactor components. Reactor materials susceptible to said stress corrosion include carbon steel, alloy steel, stainless steel, **nickel-based**, cobalt-based, and zirconium-based alloys (see column 1, lines 37-40, in Hettiarachchi ('893)). The noble metal (i.e., platinum or palladium) compound decomposes under reactor thermal and radiation conditions to release ions/atoms of the noble metal that incorporate in or deposit on the oxide film formed on stainless steel and other alloy components. Said oxide film can have a 0.1-1 micron thickness (see page 6, lines 45+, Hettiarachchi ('893)).

Hettiarachchi also discloses that mixtures of platinum group compounds and non-platinum group compounds may be used. Possible non-platinum group metals include titanium. Also when mixtures of platinum and non-platinum group metals are used, the platinum group metal is **in excess** of the other metal (see column 5, 2<sup>nd</sup> paragraph in Hettiarachchi ('893)). Note that the platinum is in the form of an aqueous solution or suspension and introduction of titanium with platinum to form a mixture inherently produces TiO<sub>2</sub>. Also, by having such excess of a platinum group metal over the non-platinum group metal (such as titanium), the TiO<sub>2</sub> molecules would be coated with a platinum group metal.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 10, 14, 15, 17, 18, and 25 are rejected under 35 U.S.C. 102(b) as being unpatentable over Andresen et al. (U.S. 5,608,766) in view of either one of Hettiarachchi ('893) or Hettiarachchi ('991). Andresen et al. disclose the applicant's claim except for the specific thickness of the potential reducing substance. Andresen et al. disclose a method to mitigate stress corrosion cracking in a water-cooled reactor by doping stainless steel surfaces with a noble metal (e.g., palladium) in-situ into the high-temperature water of the reactor (see column 6, last paragraph). The

noble metal can be injected in conjunction with injection of small amounts of hydrogen (see column 9, top paragraph). The method optionally includes the step of removing some or all of the oxide film on the surface of the reactor component in situ and then co-depositing metal, e.g., palladium during subsequent growth of the oxide film. The result is a metal-doped oxide film having a relatively longer catalytic life in the reactor-operating environment (see column 5, 2<sup>nd</sup> to last paragraph).

Andressen discloses the use of a combination of noble metals and corrosion-inhibiting metals, including titanium (e.g., see claims 1 and 5).

As discussed in section 4 above, Hettiarachchi teaches that when a mixture of platinum and non-platinum group metals are used, the platinum group metal is in excess of the other metal. He further teaches an oxide film that can have a 0.1-1 micron thickness.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by Andressen, by the teachings of Hettiarachchi, in order to have a corrosion potential reducing substance of TiO<sub>2</sub> coated with a platinum group metal formed on the surface of a reactor structural member to a thickness of 0.1 to 1 micron, because such modification is no more than the use of conventional designs/techniques within the nuclear art, and the use of well-known concentration ratios and coating thickness for the electrochemical potential reducing substance.

6. Claims 12, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Hettiarachchi ('893) or Hettiarachchi ('991). as applied to claims 10,

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14, 15, 17, 18, and 25 above, and further in view of either one of Uetake et al. (U.S. 5,377,245) or Panson et al. (U.S. 4,842,812). Either one of Hettiarachchi ('893) or Hettiarachchi ('991) discloses the applicant's claims except for controlling the iron concentration by a purifier and demineralizer.

Either one of Uetake et al. or Panson et al. teach for mitigating the radiation exposure of personnel by reducing the amount of iron "crud" in the reactor water. Either one of these references disclose the use of a clean-up device (e.g. a filter) and demineralizer to remove said crud contained in the condensed water (e.g. see Fig. 1. and column 6, lines 35+ of Uetake et al., or Fig. 1 and column 5, 2<sup>nd</sup> paragraph of Panson et al.). One having ordinary skill in the art would have recognized the advantages of crud reduction, in addition to stress corrosion mitigation, as part of nuclear power plant operation, and the addition of such crud reduction process would have been prima facie obvious.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by either one of Hettiarachchi ('893) or Hettiarachchi ('991), by the teaching of either one of Uetake et al. or Panson et al., to include an iron crud reduction process by a purifier and demineralizer in the condensing system of a reactor, to gain the advantages thereof (i.e., to further reduce of personnel radiation exposure), because such modification is no more than the use of conventional techniques within the nuclear art.

7. Claims 12, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of the Andresen- Hettiarachchi ('893) combination or Andresen-



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Hettiarachchi ('991) combination, as applied to claims 10, 14, 15, 17, 18, and 25 above, and further in view of either one of Uetake et al. or Panson et al. . Either one of the two combinations discloses the applicant's claims except for controlling the iron concentration by a purifier and demineralizer.

Either one of Uetake et al. or Panson et al. teach for mitigating the radiation exposure of personnel by reducing the amount of iron "crud" in the reactor water. Either one of these references disclose the use of a clean-up device (e.g. a filter) and demineralizer to remove said crud contained in the condensed water (e.g. see Fig. 1 and column 6, lines 35+ of Uetake et al., or Fig. 1 and column 5, 2<sup>nd</sup> paragraph of Panson et al.). One having ordinary skill in the art would have recognized the advantages of crud reduction, in addition to stress corrosion mitigation, as part of nuclear power plant operation, and the addition of such crud reduction process would have been prima facie obvious.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by either one of Andresen- Hettiarachchi ('893) combination or Andresen- Hettiarachchi ('991) combination, by the teaching of either one of Uetake et al. or Panson et al., to include an iron crud reduction process by a purifier and demineralizer in the condensing system of a reactor, to gain the advantages thereof (i.e., to further reduce of personnel radiation exposure), because such modification is no more than the use of conventional techniques within the nuclear art.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 7:00-4:30, Mon-Fri; 1st Friday off.

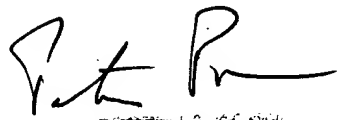
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

RJP

July 31, 2003

  
PETER M. POON  
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